Influence of Incubation Temperature and Time on Resistant Starch Type III Formation From Autoclaved and Acid-Hydrolysed Cassava Starch

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Abstract

Raw cassava starch, having 74.94 and 0.44 g/100 g resistant starch type II and III (RS II and RS III), respectively, was autoclaved at 121 °C in water, 1, 10 or 100 mmol/L lactic acid. The formation of RS III was evaluated in relation to variable incubation temperature (−20 to 100 °C), incubation time (6–48 h) and autoclaving time (15–90 min). Negligible to low quantities of RS III (0.59–2.42 g/100 g) were formed from autoclaved starch suspended in 100 mmol/L lactic acid, whereas intermediate to high quantities (2.68–9.97 g/100 g) were formed from autoclaved starch suspended in water, 1 or 10 mmol/L lactic acid, except for treatments with water or 10 mmol/L lactic acid incubated at 100 °C for 6 h (1.74 g/100 g). Autoclaving times corresponding to maximum RS III contents were 15 and 45 min for water and 10 mmol/L lactic acid, respectively. Whereas, the RS III fractions from cassava starch suspended in water had melt transitions between 158 and 175 °C with low endothermic enthalpies (0.2–1.6 J/g), the thermal transitions of the acid treated samples were indistinct.

Keywords.

Cassava starch extraction and composition, Composition of isolated cassava starch, incubation temperature.